Impact-E 3x series embedded computer user manual

Atom Embedded Computers

Impact-E 3x series

Impact-E 30 / 35

User manual
(Issue A1)

Part No: 85090586

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Acknowledgements

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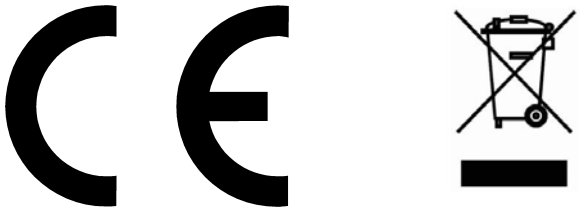
Disclaimer

This instruction manual is supplied to provide the user with sufficient information to utilise the purchased product in a proper and efficient manner. The information contained has been reviewed and is believed to be accurate and reliable. However, Amplicon Liveline Ltd accepts no responsibility for any problems caused by errors and omissions. Specifications and instructions are subject to change without notice.

The Impact-E 3x series Atom embedded computers are RoHS compliant.



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Safety Precautions

- Before you unpack your embedded computer system, ensure you carefully read through this manual and follow any related safety and operational instructions.
- Only suitably qualified and experienced personnel should access the internals of the unit.
- Before commencing work within the computer ensure that the mains is disconnected from the computer and any attached peripherals.

Operation of your panel PC

Before operating your embedded computer please:

- Read the equipment ratings plate and ensure that the mains circuit is suitably rated to power the equipment, to avoid risk of overloading. Do not use mains adaptors or extension cables.
- Ensure that any cables connected to the equipment are made safe and do not present a tripping hazard.
- To avoid risk of electric shock ensure that equipment is plugged into a suitably earthed mains outlet. Only use the power cord supplied with your computer or power supply unit. Do not continue to use the cable if it is cut or damaged.
- Ensure the computer chassis is kept away from heat sources, such as radiators and heating vents.
- The computer must have sufficient free space around it to allow air movement for cooling purposes. Failure to do so is likely to cause the unit to overheat and become unstable.
- Avoid connecting the computer to an electrical supply which may have unacceptable interruptions, surges, spikes or noise. We recommend the use of an uninterruptible power supply (UPS), surge protector or mains conditioner to address the problem.
- Turn OFF the system power before cleaning. Clean the system using a cloth only. Do not spray any liquid cleaner directly onto the computer surface.

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Electrostatic Discharge Damage

- When accessing the internals of the computer, you must be aware that many of the components are electrostatic discharge sensitive (ESD). These components can easily be damaged if suitable precautions are not taken. ESD damage is not always immediately apparent and may result in a failure many weeks later. When working on equipment we recommend the use of an ESD mat and wrist strap.

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Chapter 1

Introduction

This chapter contains general information and detailed specifications of the Impact-E 3x series Atom embedded computers.

Impact-E 30 – Atom embedded computer with 1 x PCI card slot
Impact-E 35 – Atom embedded computer with 1 x PCIe x1 card slot

1.1 General Description

The Impact-E 3x is a fanless, Atom based, rugged embedded system designed for industrial and commercial applications. It features extensive I/O interfaces, a PCI or PCI Express expansion slot. Powered by an Intel Atom processor the system offers exceptional performance with very low heat generation and minimal cooling requirements, resulting in optimised stability and longevity, and providing a high return on investment.

Optimised computing via Intel Atom processors
Impact-E 3x embedded computers feature Intel Atom processors and Intel 945GSE + ICH7M chipset to provide powerful computing performance and low power consumption.

With six Serial COM ports, dual Gigabit Ethernet ports and up to 2GB of system memory, these embedded computers can deliver computing capability for high performance and demanding applications.

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Expandable for 1 PCI / PCIe x1 slot
The Impact-E 30 has a PCI slot, while the Impact-E 35 has a PCIe x1 slot for card expansion.

Compact designed embedded computers
Impact-E 3x have a rugged and compact chassis making them ideal for space critical applications.

1.2 Features and Benefits

Featuring Intel 945GSE & ICH7M chipsets, the Impact-E 3x embedded computer supports Intel's Atom N270 1.6GHz processor with 533MHz FSB and DDR2 SODIMM memory. This rugged fanless embedded computer is designed for space-critical applications requiring extreme reliability, low-power consumption and versatile I/O configuration. For added flexibility, this system also boasts four RS232 ports, two RS232/422/485 ports and a PCI / PCIe expansion slot.

For data storage, the Impact-E 3x provides 1 x CompactFlash socket and 1 x 2.5" HDD / solid state drive bay. The System supports ATX mode power feature and can accept a wide range of power supplies from +9 V DC to +36V DC.

Housed in a compact 190 mm x 268 mm x 65 mm heavy-duty aluminium chassis, the Impact-E 3x is designed for reliable, maintenance-free industrial computing. This fanless embedded computer offers a cost-effective solution for a multitude of mission-critical computing applications in automation, machine control and POS systems.

- Onboard Intel Atom N270 1.6GHz processor
- Intel® 945GSE + ICH7M Chipsets
- Dual 1000/100/10Mbps LAN ports
- 6 Serial COM ports
- 6 x USB2.0
- VGA, DVI-D video output
- 4 x DIO
- 1 x PCI expansion slot (Impact-E 30 only)
- 1 x PCIe x1 expansion slot (Impact-E 35 only)
- Supports up to 1GB DDR2 SODIMM memory (+1GB onboard memory)
- CompactFlash Type I/II
- 2.5" SATA HDD / solid state drive support

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1.3 System Specifications

FEATURE	DESCRIPTION	
Form Factor	Fanless Embedded System	
Platform	Processor	Onboard Intel Atom 1.6 GHz
	Chipset	Intel 945GSE+ICH7M
	BIOS	AMIBIOS with 8Mbit BIOS Flash
System Memory	Technology	533 MHz DDR2 SDRAM
	Socket	1 x 200-pin DDR2 SODIMM
	Onboard Memory	1GB DDR2 onboard
	Maximum Capacity	2GB
Storage Interface	CompactFlash I/II	1
	SATA Port	2
Display	Interface	VGA D-Sub 15-pin connector
		DVI-D
Audio	Codec	ALC888 HD Codec
Networking	LAN Ports	2
	Speed	10/100/1000 Mbps
Front I/O	Digital I/O	DB9 Female 4 in 4 Out
	USB 2.0	6
	LAN	2 x RJ45 GbE
	Mic In / Line Out	1/1
Rear I/O	Serial	RS-232 x 4; RS-232/422/485 x 2 (COM 1, 3)
	DVI-D	1
	VGA	1
Expansion		PCI x 1 (Impact-E 30)
		PCIe x 1 (Impact-E 35)
Hardware Monitoring	Controller	Winbond W83627UHG integrated hardware monitor
	Watchdog timer	Reset supported, 1~255 level
OS Supported		Linux kernel 2.4.16 or above, XPE/Win XP-32 bit, Win CE 6.0
Environmental Parameters	Temperature, ambient operating	-20°~ 50℃ (with industrial components - CF card, HDD, Memory, adapter)
		0 ~ 40℃ (with 2.5” commercial HDD)
	Humidity (RH), ambient operating	10 ~ 95% relative humidity, non-condensing

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	Storage Temperature	-20° ~ 80℃
	Shock	CFD: 100g peak acceleration (6 msec duration)
Mounting		Wall mounting kit VESA mounting kit (Optional)
Physical Dimensions	Dimensions	190D x 268W x 65H mm
	Weight	2.6Kg (without HDD)
Power	Input	DC +9V~36V

NOTE: All specifications and images are subject to change without notice.

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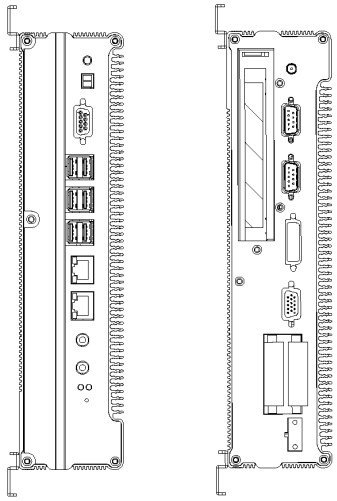
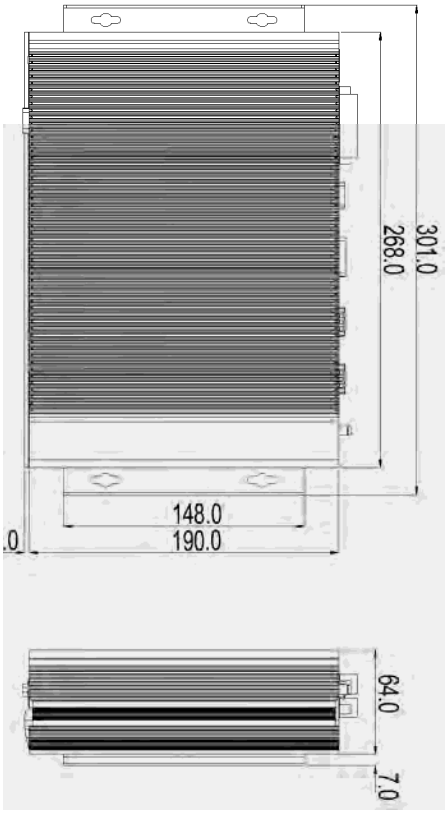
1.4 Dimensions

- **Impact-E 30 / 35 dimensions**





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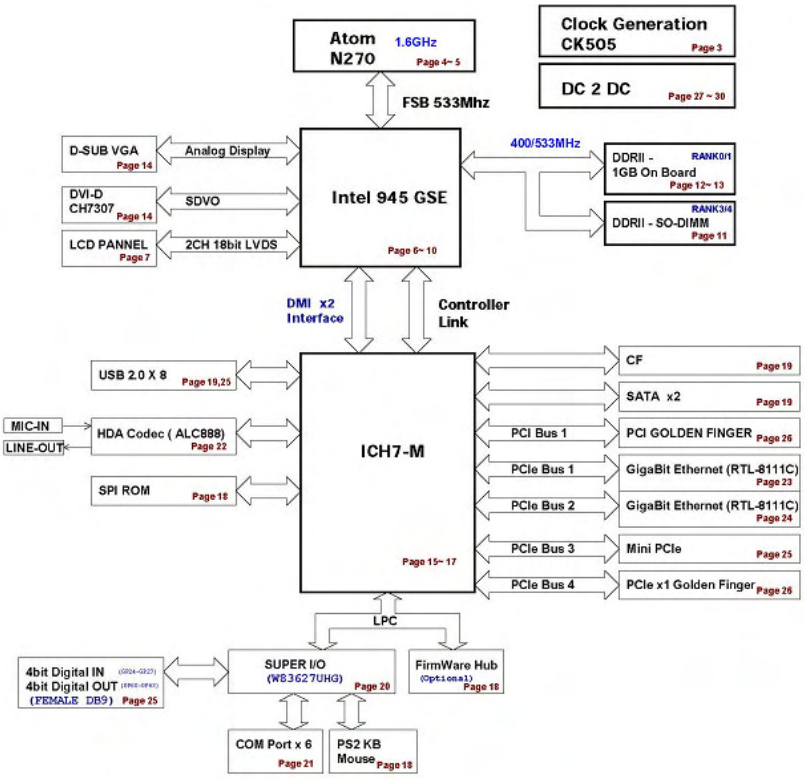
1.5 Block Diagram


Atom N270 1.6GHz Page 4~ 5
Clock Generation CK505 Page 3
DC 2 DC Page 27 ~ 30
FSB 533Mhz
D-SUB VGA Page 14
Analog Display
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CF Page 19
SATA x2 Page 19
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GigaBit Ethernet (RTL-8111C) Page 23
PCIe Bus 2
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PCIe Bus 3
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LPC
4bit Digital IN
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SUPER I/O (W83627UHG) Page 20
FirmWare Hub (Optional) Page 18
COM Port x 6 Page 21
PS2 KB Mouse Page 18

Figure 2 – Block Diagram

1.6 Package List

When you receive the Impact-E 3x series embedded computer, please find the following items in the package.

- Impact-E 3x embedded computer
- DC +19V 75W power adapter x 1
- Amplicon product CD x1
- Serial ATA/Power Cable x 1
- HDD kits x 1 (Spacer x 4, Screw x 4)
- Wall mount kit
- VESA mount kit (Optional)

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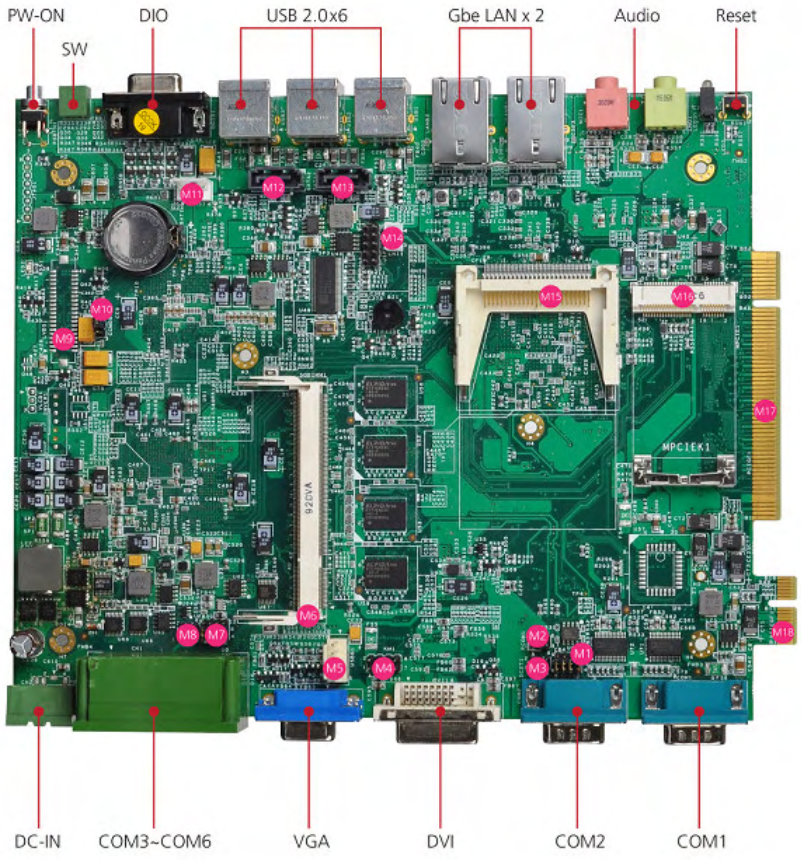
Chapter 2

System Components

2.1 Embedded System Board



- M1 Select COM2 Type Jumper-SC2T2
- M2 Select COM2 Type Jumper-SC2T1
- M3 Select COM1 Pin9 Signal Jumper-PCOM1
- M4 Keyboard/Mouse Connector Header -KM1
- M5 USB Port#7 5-Pin Power Connector-USBG1
- M6 200 PIN DDR2 SODIMM Socket-SODIMM1
- M7 Select COM3 Type Jumper-SC3T2
- M8 Select COM3 Type Jumper-SC3T1
- M9 Select Panel Voltage Header-VLCD1
- M10 Clear CMOS Data Jumper-CCMOS1
- M11 4-Pin Power Connector-PS4S1
- M12 Serial ATA-SATA Socket-SATA2
- M13 Serial ATA-SATA Socket-SATA1
- M14 Line In 3Pin Connector-LNI1
- M15 Compact Flash Connector-CF1
- M16 Mini PCI Express 1X Connector-MPCIE1
- M17 120 Pin PCI Golden Finger-PCIGF1
- M18 PCI Express 1x Golden Finger-PCIEGF1

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2.2 Jumper Settings and I/O Connectors

The jumper settings and I/O connectors of the embedded board have been set to default as standard. Any changes to the schematic or design of these connectors may cause damage to your unit.

Default jumper settings and I/O connector summary are as below:

JUMPER	FUNCTION
SC2T1	Select COM2 Type Jumper
SC2T2	Select COM2 Type Jumper
PCOM1	Select COM1 Pin9 Signal Jumper
KM1	Keyboard/Mouse Connector Header (for Factory test only)
USBG1	USB Port#7 5-Pin Power Connector (5P Male)
SODIMM1	200 PIN DDR2 SODIMM Socket
SC3T1	Select COM3 Type Jumper
SC3T2	Select COM3 Type Jumper
VLCD1	Select Panel Voltage Header (Reserved)
LVDS1	LVDS Connector (Optional)
CCMOS1	Clear CMOS Data Jumper
PS4S1	4-Pin Power Connector (4P Male)
SATA1	Serial ATA-SATA Socket (Port 1)
SATA2	Serial ATA-SATA Socket (Port 2)
LNI1	Line In 3Pin Connector
CF1	Compact Flash Connector
MPCIE1	Mini PCI Express 1X Connector
PCIGF1	120 Pin PCI Golden Finger
PCIEGF1	PCI Express 1x Golden Finger
COM1/2	Serial Port COM1/2 Connector (D-SUB9 Male)
DGIO1	DIO Connector (D-SUB9 Female)
CN1	COM3 – 6 Connector
CN2	DC-IN Connector (9 ~ 36V)
PSW1	SW Connector (ATX Power Switch Connector)
PSBTN1	PW-ON Button

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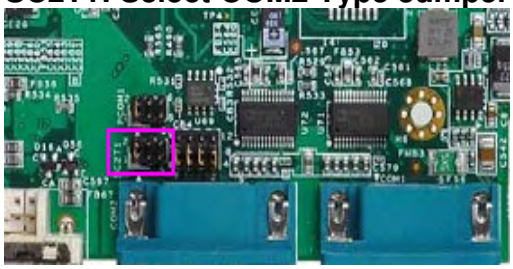
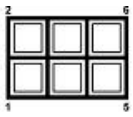
2.2.1 Connector Pin Assignments

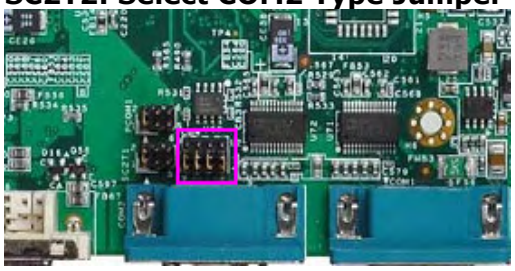
SC2T1: Select COM2 Type Jumper

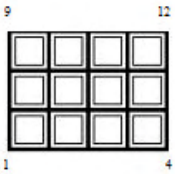




COM2 TYPE	SC2T1	SC2T2
RS-232 (Default)	1-2	1-5,2-6,3-7,4-8
RS-422	3-4	5-9,6-10,7-11,8-12
RS-485	5-6	5-9,6-10,7-11,8-12

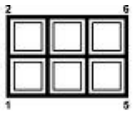
SC2T2: Select COM2 Type Jumper





COM2 TYPE	SC2T1	SC2T2
RS-232 (Default)	1-2	1-5,2-6,3-7,4-8
RS-422	3-4	5-9,6-10,7-11,8-12
RS-485	5-6	5-9,6-10,7-11,8-12

PCOM1 : Select COM1 Pin9 Signal Jumper



Description	PCOM1
Ring In	1-2 (Default)
+5V	3-4
+12V	5-6

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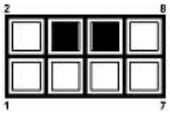
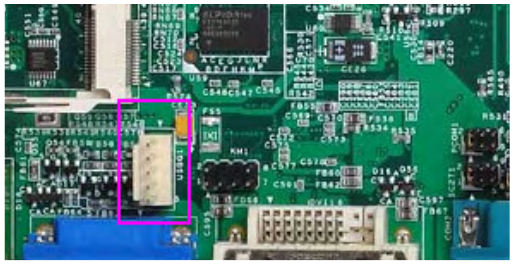
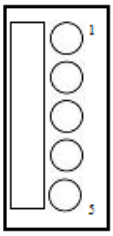
KM1 : Keyboard/Mouse Connector Header (for Factory test only)



Pin	Description	Pin	Description
1	+5V	2	MSCLK
3	MSDATA	4	KEY
5	KBDAT	6	KEY
7	GND	8	KBCLK

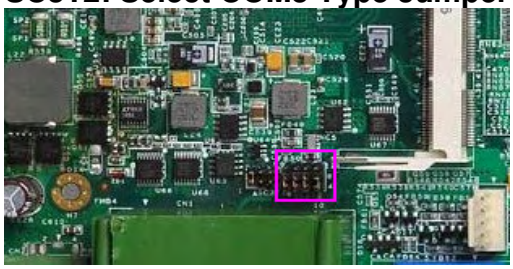
USBG1: USB Port#7 5-Pin Power Connector (5P Male)

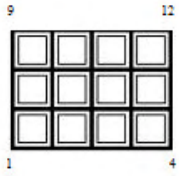




PIN	DESCRIPTION
1	USB_VCC
2	USBD0-
3	USBD0+
4	Ground
5	Case Ground

SC3T2: Select COM3 Type Jumper





COM3 TYPE	SC3T1	SC3T2
RS-232 (Default)	1-2	1-5,2-6,3-7,4-8
RS-422	3-4	5-9,6-10,7-11,8-12
RS-485	5-6	5-9,6-10,7-11,8-12

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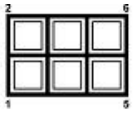
SC3T1: Select COM3 Type Jumper

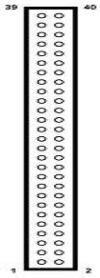


COM3 TYPE	SC3T1	SC3T2
RS-232 (Default)	1-2	1-5,2-6,3-7,4-8
RS-422	3-4	5-9,6-10,7-11,8-12
RS-485	5-6	5-9,6-10,7-11,8-12

VLCD1: Select Panel Voltage Header (Reserved)

Panel Voltage	VLCD1
+3.3V (Default)	1-2
+5V	2-3

LVDS1: LVDS Connector
(2Channel 18bits 2x20 1.25mm Connector /Optional)



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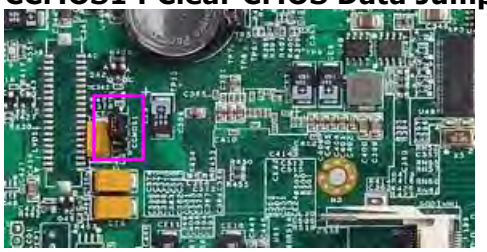
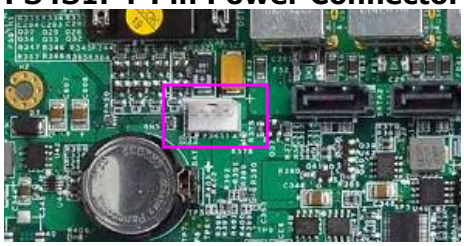
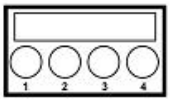
CCMOS1 : Clear CMOS Data Jumper



Description	CCMOS1
Normal (Default)	1-2
Clear CMOS	2-3

PS4S1: 4-Pin Power Connector (4P Male)

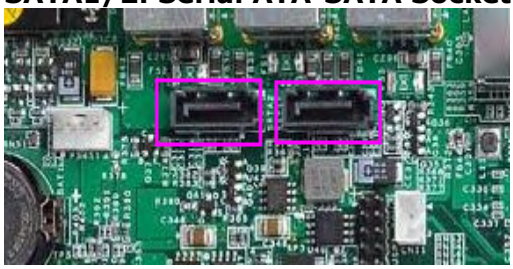




Pin No.	Description
1	+5V
2	GND
3	GND
4	+12V

NOTE: System can only house 1 x 2.5” HDD / solid state drive.

SATA1/2: Serial ATA-SATA Socket



PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

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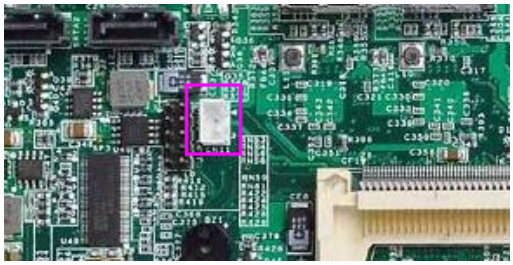
NOTE: **When you connect SATA cable, the Pin 7 of cable will automatically switch to GND. (Normal Pin7 is +5V for SATA-DOM)**

LNI1 : Line In 3Pin Connector



Pin No.	Description
1	LIN-L
2	CO_GND
3	LIN-R

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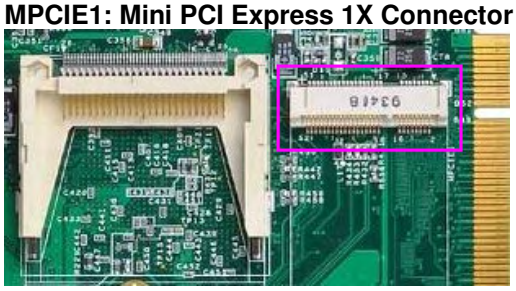
MPCIE1: Mini PCI Express 1X Connector



Pin No.	Description	Pin No.	Description
1	WAKE#	2	+3.3V
3	RSV1	4	Ground
5	RSV2	6	+1.5V
7	CLKREQ#	8	UIM_PWR
9	Ground	10	UIM_DATA
11	REFCLK-	12	UIM_CLK
13	REFCLK+	14	UIM_RESET
15	GND3	16	UIM_VPP
KEY		KEY	
17	RSV3	18	Ground
19	RSV4	20	W_DISABLE#
21	GND5	22	PERST#
23	PERn0	24	+3.3Vaux
25	PERp0	26	Ground
27	Ground	28	+1.5V
29	Ground	30	SMB_SLK
31	PETn0	32	SMB_DATA
33	PETp0	34	Ground
35	Ground	36	USB_D-
37	RSV5	38	USB_D+
39	RSV6	40	Ground
41	RSV7	42	LED_WWAN#
43	RSV8	44	LED_WLAN#
45	RSV9	46	LED_WPAN#
47	RSV10	48	+1.5V
49	RSV11	50	Ground
51	RSV12	52	+3.3V

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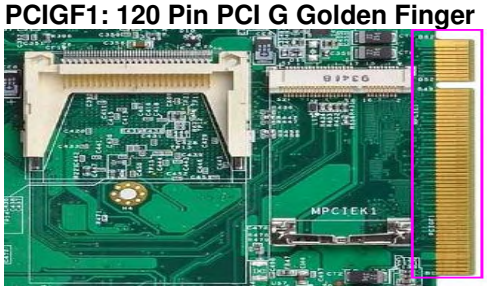
PCIGF1: 120 Pin PCI G Golden Finger



Pin No.	System Environment		Pin No.	System Environment	
	Side B	Side A		Side B	Side A
1	-12V	TRST# (Ground)	32	AD(17)	AD(16)
2	TCK (Ground)	+12V	33	C/BE(2)#	+3.3V
3	Ground	TMS (Ground)	34	Ground	FRAME#
4	TDO	TDI (Ground)	35	IRDY#	Ground
5	+5V	+5V	36	+3.3V	TRDY#
6	+5V	INTA#	37	DEVSEL#	Ground
7	INTB#	INTC#	38	Ground	STOP#
8	INTD#	+5V	39	LOCK#	+3.3V
9	PRSNT1#	Reserved	40	PERR#	SDONE (SMBclk)
10	Reserved(PREQ-1)	VI/O (NC)	41	+3.3V	SBO# (SMBdata)
11	PRSNT2#	Reserved	42	SERR#	Ground
12	Ground	Ground	43	+3.3V	PAR
13	Ground	Ground	44	C/BE(1)#	AD(15)
14	Reserved(PCLK2)	3.3Vaux/PGNT-1	45	AD(14)	+3.3V
15	Ground	RST#	46	Ground	AD(13)
16	CLK	VI/O (NC)	47	AD(12)	AD(11)
17	Ground	GNT# (PGNT-0)	48	AD(10)	Ground
18	REQ# (PREQ-0)	Ground	49	M66EN (Ground)	AD(09)
19	VI/O (NC)	PME#	50	KEY	KEY
20	AD(31)	AD(30)	51	KEY	KEY
21	AD(29)	+3.3V	52	AD(08)	C/BE(0)#
22	Ground	AD(28)	53	AD(07)	+3.3V
23	AD(27)	AD(26)	54	+3.3V	AD(06)
24	AD(25)	Ground	55	AD(05)	AD(04)
25	+3.3V	AD(24)	56	AD(03)	Ground
26	C/BE(3)#	IDSEL (AD16)	57	Ground	AD(02)
27	AD(23)	+3.3V	58	AD(01)	AD(00)
28	Ground	AD(22)	59	VI/O (NC)	VI/O (NC)
29	AD(21)	AD(20)	60	ACK64#	REQ64#
30	AD(19)	Ground	61	+5V	+5V
31	+3.3V	AD(18)	62	+5V	+5V

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PCIEGF1: PCI Express 1x Golden Finger

Pin No.	Side B	Side A
1	12V	PRSNT1#
2	12V	12V
3	12V	12V
4	Ground	Ground
5	SMBCLK	JTAG2
6	SMBDATA	JTAG3
7	Ground	JTAG4
8	+3.3V	JTAG5
9	JTAG1	+3.3V
10	+3.3VAUX	+3.3V
11	WAKE#	PCIE_RESET-
	KEY	KEY
12	Reserved	Ground
13	Ground	DEFCLK+
14	PE_TX0+	DEFCLK-
15	PE_TX0-	Ground
16	Ground	PE_RX0+
17	PRSNT2#	PE_RX0-
18	Ground	Ground

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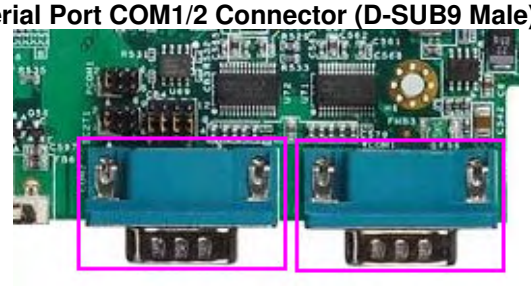
Serial Port COM1/2 Connector (D-SUB9 Male)



PIN NO.	DESCRIPTION		
TYPE	RS-232	RS-422	RS-485
1	Data Carrier Detect (DCDA #)	422TX+	DATA+
2	Receive Data (RXDA)	422TX-	DATA-
3	Transmit Data (TXDA)	422RX+	
4	Data Terminal Ready (DTRA #)	422RX-	
5	Ground (GND)		
6	Data Set Ready (DSRA #)		
7	Request To Send (RTSA #)		
8	Clear To Send (CTSA #)		
9	Ring Indicator (RIA #)		

NOTE: **COM1:RS-232 Only; COM2:RS-232,RS422,RS485**

DIO Connector (D-SUB9 Female)

PIN NO.	DESCRIPTION
1	Digital IN 0
2	Digital IN 1
3	Digital IN 2
4	Digital IN 3
5	Ground
6	Digital Out 0
7	Digital Out 1
8	Digital Out 2
9	Digital Out 3

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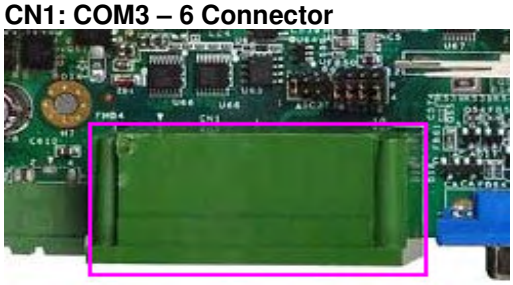
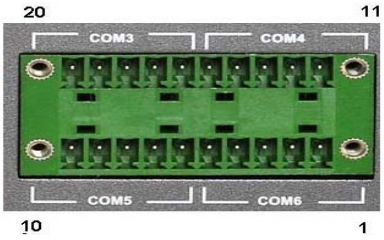
CN1: COM3 – 6 Connector

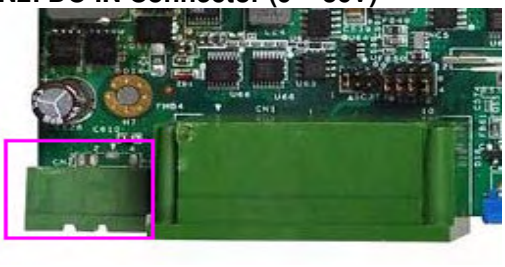




	COM3					COM4				
Pin No.	20	19	18	17	16	15	14	13	12	11
RS-232	RTS3#	SIN3	SOUT3	CTS3#	GND	RTS4#	SIN4	SOUT4	CTS4#	GND
RS-422	TX+	TX-	RX+	RX-	GND					
RS-485 4-wire	TX+	TX-	RX+	RX-	GND					
RS-485 2-wire	DATA+	DATA-	NC	NC	GND					
	COM5					COM6				
Pin No.	10	9	8	7	6	5	4	3	2	1
RS-232	RTS5#	SIN5	SOUT5	CTS5#	GND	RTS6#	SIN6	SOUT6	CTS6#	GND

NOTE: Only COM3 can select RS-232/RS-422/RS-485 Pin1~5: COM6, Pin6~10: COM5, Pin11~15: COM4, Pin16~20: COM3

CN2: DC-IN Connector (9 ~ 36V)



PIN	DESCRIPTION
1	GND
2	DC IN

PSW1: SW Connector (ATX Power Switch Connector)

PIN	DESCRIPTION
1	Button-
2	GND

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PSBIN1: PW-ON Button (with 2 colour LED)

PIN	DESCRIPTION	PIN	DESCRIPTION
PAD1	Ground	PAD2	Ground
1	Ground	3	BUTTON-
2	Ground	4	BUTTON-
L1	PWR_LED+ / STB_LED-	L2	PWR_LED- / STB_LED+

NOTE: Power ON: Green LED; Standby: Red LED

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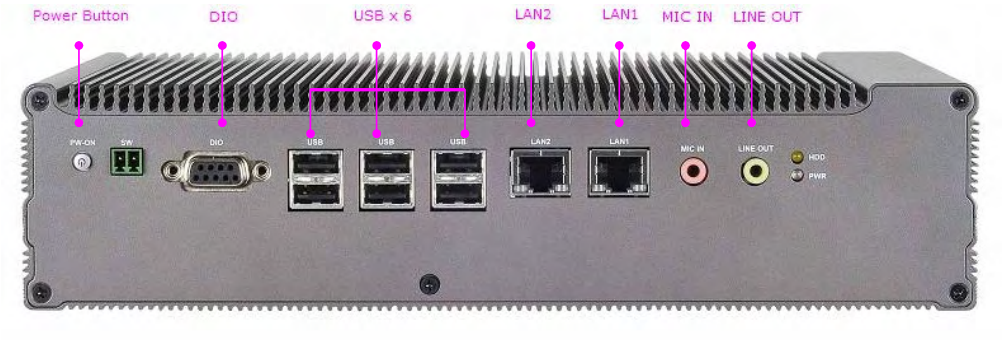
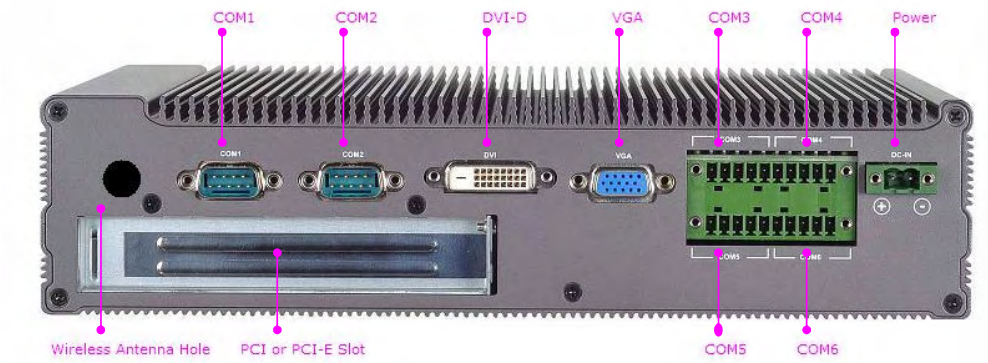
2.3 System Layout

This section of the manual describes the mechanical and device nomenclature of the Impact-E 30 / 35.

2.3.1 Front View



2.3.2 Rear View



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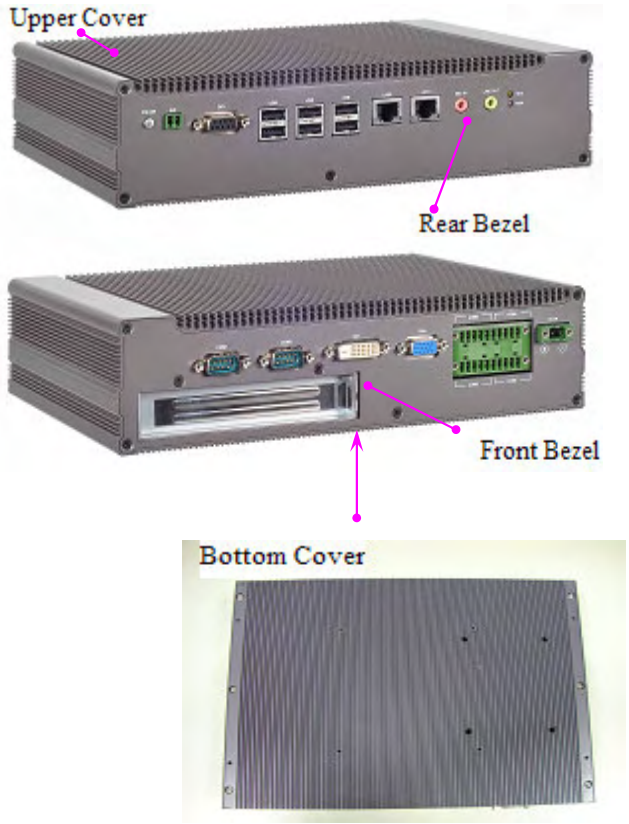
Chapter 3

Hardware Installation

This chapter shows how to install different components into the Impact-E 3x embedded computer.

3.1 Impact-E 3x Embedded System



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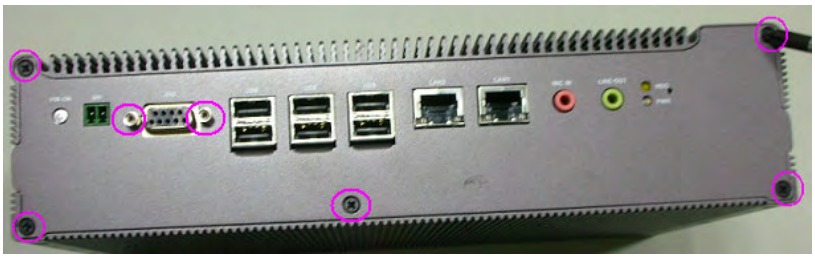
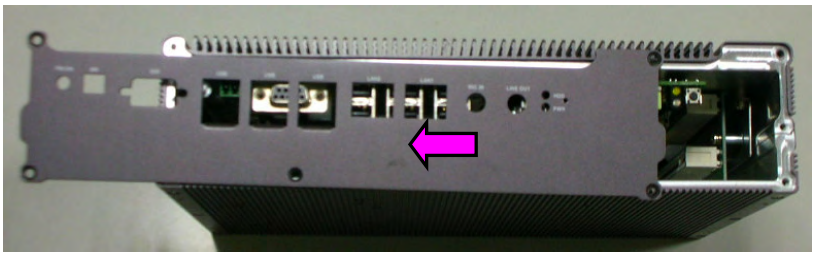
3.1.1 Installation

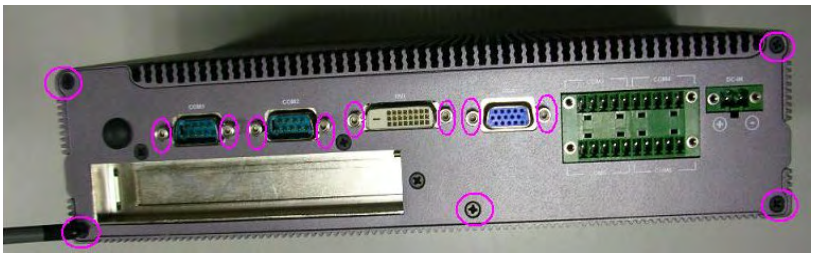
1. Remove the 5 screws and 2 spacers at the front panel



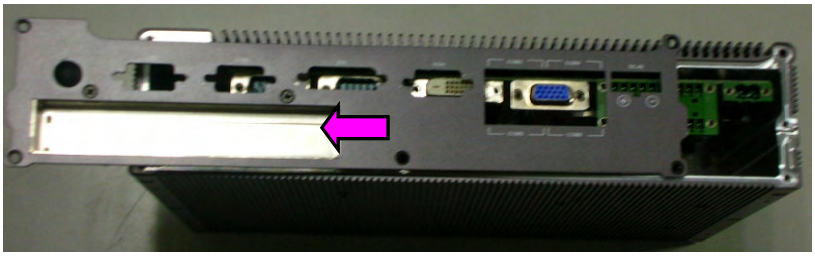
2. Remove the front panel



3. Unscrew the 5 screws and 8 spacers at the rear panel



4. Remove the rear panel



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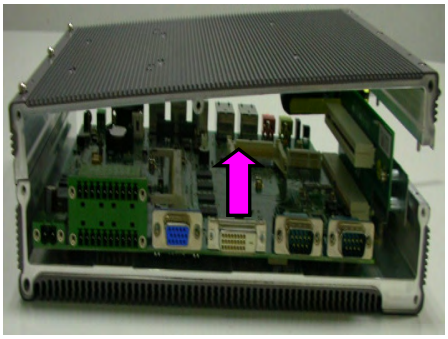
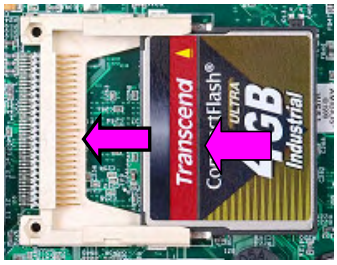
5. Remove the 6 screws at the bottom cover and then remove the bottom cover



3.1.2 System Memory Installation

Insert the memory module into the memory socket and push firmly until it is fully seated.

3.1.3 CompactFlash Card Installation



Carefully insert the CompactFlash card into the slot as shown in the illustration above.

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3.1.4 Hard Disk Installation

HDD mounting components:

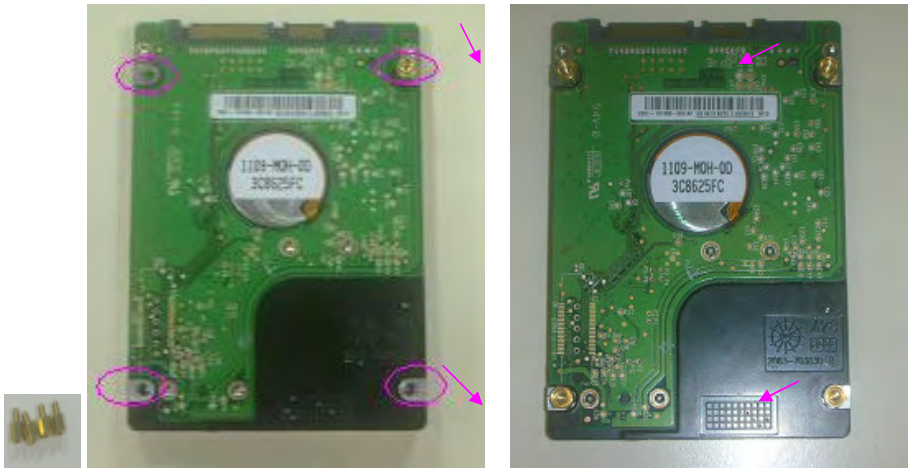
- Spacer x 4
- HDD Screw x 4
- Serial ATA/Power Cable x 1

Spacer

HDD Screw

NOTE: Please use these to install 2.5" HDD / solid state drive

1. Secure with 4 spacers on the HDD screw hole (4 screw holes)



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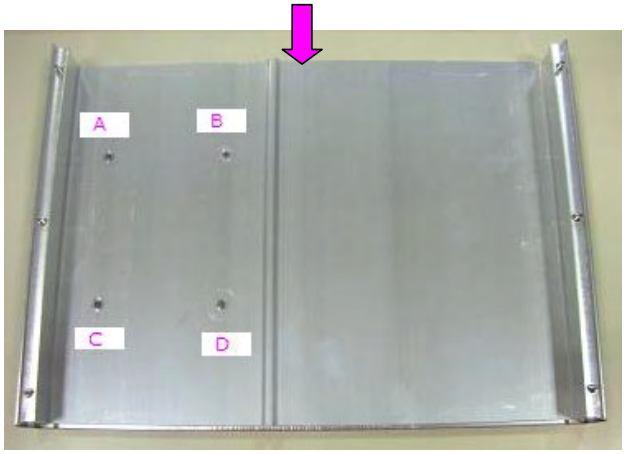
2. Invert aluminium bottom cover

Inside View of the bottom cover



3. Position the hard disk on the bottom cover properly so that the screw holes of the hard disk can match the holes with the cover for installation.

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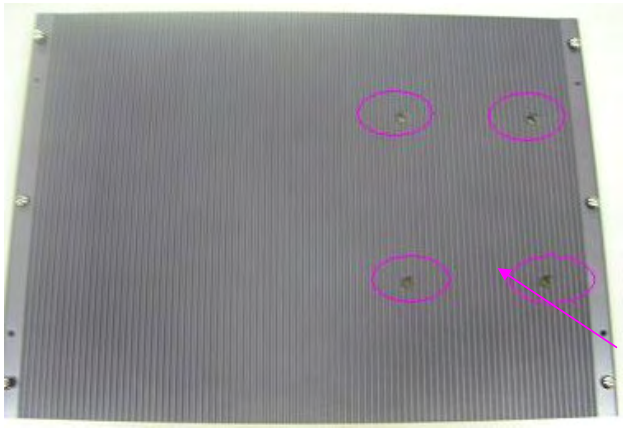
4. Begin to secure the hard disk with the four HDD screws on the right side of the bottom cover (Please see inset).



Secure with 4 HDD screws on the right side of bottom cover

5. Connect the Serial ATA/Power Cable to the HDD

Serial ATA/Power Cable

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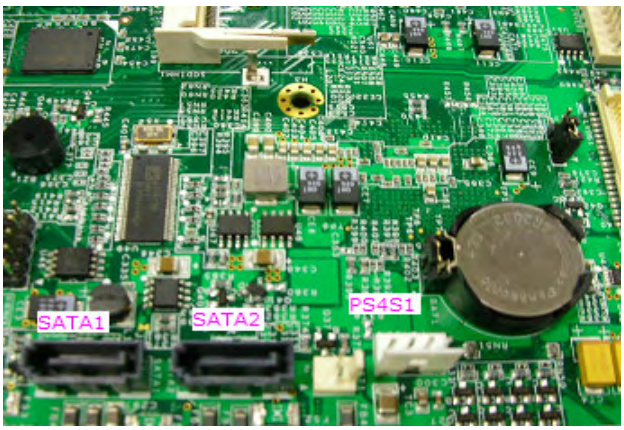
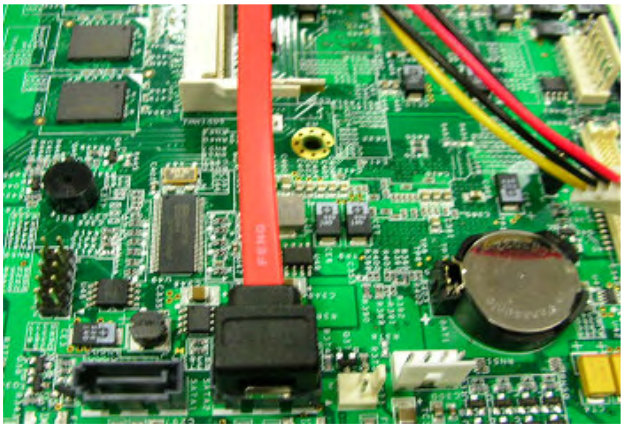
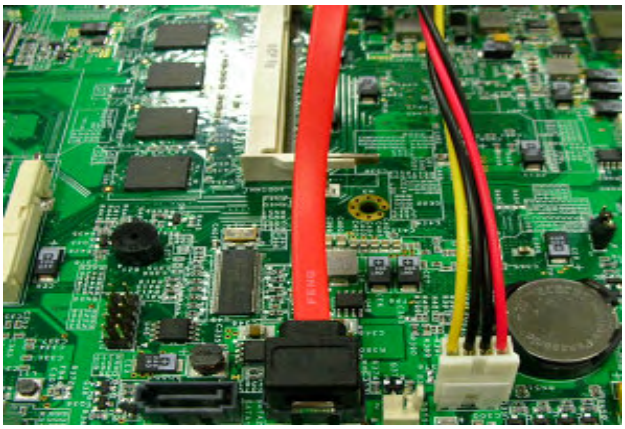
6. Plug the Serial ATA cable to the SATA Connector (SATA1 or SATA2)





Plug the Serial ATA cable to the SATA Connector

6. Plug the Power cable to the 4-Pin Power Connector (PS4S1)



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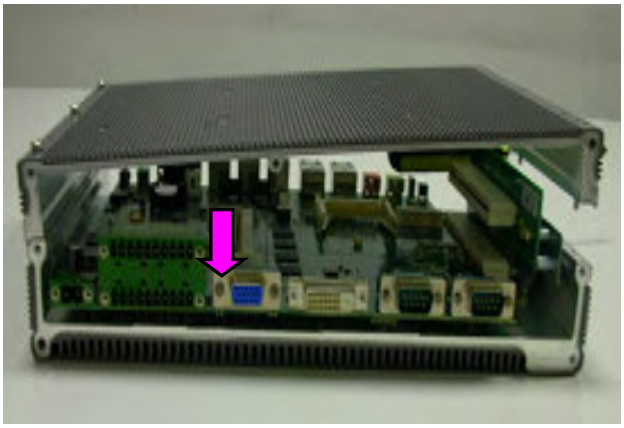
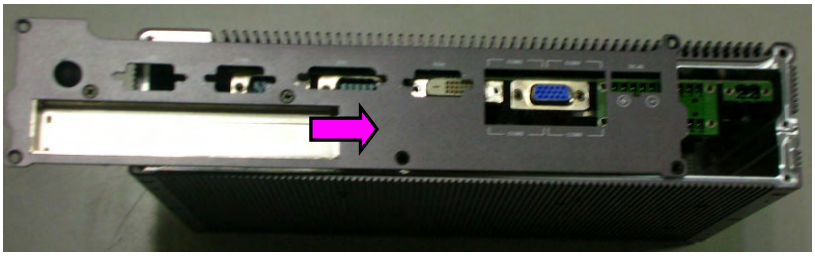
3.1.5 Reassembly Procedure

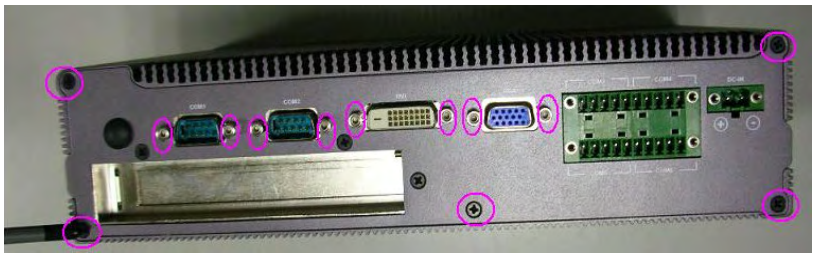
1. Replace the bottom cover



2. Replace the front panel on the system



3. Refasten the 5 screws and 8 spacers at the front panel



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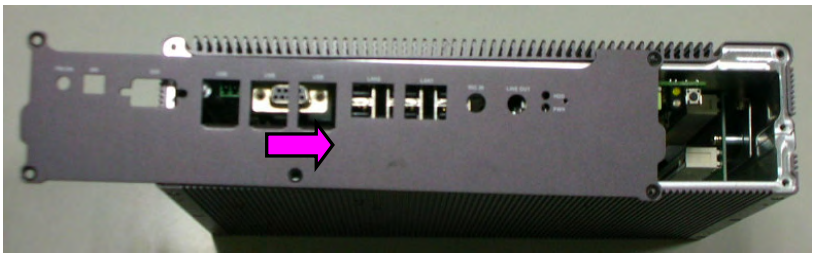
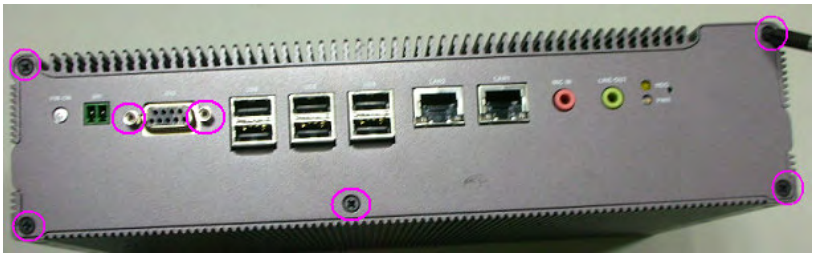
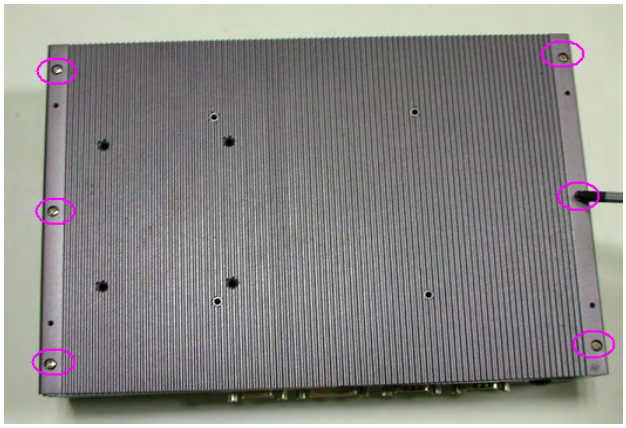
4. Replace the rear panel on the system



5. Refasten the 5 screws and 2 spacers at the rear panel



6. Refasten the 6 screws at the bottom cover then the Impact-E 3x Embedded system installation is complete.



NOTE: Please load the optimised BIOS values

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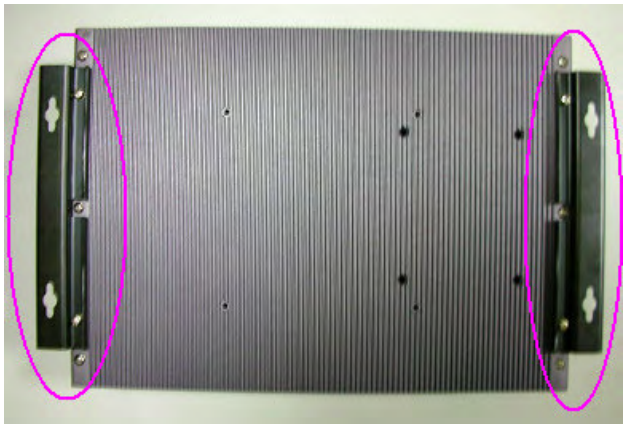
3.2 Mounting Kits

3.2.1 Wall Mount (Optional)



Wall Mount components:

- Wall Mount x 2
- Screw x 4

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A. Appendix A: LAN Port LED Indicators

Link/Active (Left LED)		
Status	Description	LED/Colour
On	LAN is link to 10 or 100 or 1000Mbps	Yellow
Blink	LAN port is receiving and transmitting packets.	Yellow

Speed (Right LED)		
Status	Description	LED/Colour
Off	LAN is link to 10Mbps	Dark
On	LAN is link to 100Mbps	Green
On	LAN is link to 1000Mbps	Yellow

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B. Appendix B: Watchdog Timer

B.1 Introduction

A watchdog timer is a piece of hardware that can be used to automatically detect system anomalies and reset the processor in the case any problems are found. Generally speaking, a watchdog timer is based on a counter that counts down from an initial value to zero. The software selects the counter's initial value and periodically restarts it. Should the counter reach zero before the software restarts it, the software is presumed to be malfunctioning, and the processor's reset signal is asserted. Thus, the processor will be restarted as if a human operator had cycled the power.

B.2 Register Descriptions

A watchdog action consists of a series of watchdog instructions. The watchdog function is controlled by a number of register values. This section describes the detail register in LPD I/O (W83697UHG).

B.2.1 Watchdog timer usage

For DOS system:
Execute the WD.EXE file under DOS (WD.EXE and CWSDPMI.EXE should be placed on same directory), then key-in 0~255. The system will reboot automatically according to the time-out you set.

NOTE: The watchdog function is from the WINBOND 83627UHG. Examples can be found on the Amplicon CD in the watchdog folder.

Watchdog Timer is controlled by CRF5, CRF6, CRF7 of Logical Device.
CRF5 (PLED mode register. Default 0x00)
Bit 7-6 : select PLED mode
= 00 Power LED pin is tri-stated.
= 01 Power LED pin is drived low.
= 10 Power LED pin is a 1Hz toggle pulse with 50 duty cycle
= 11 Power LED pin is a 1/4Hz toggle pulse with 50 duty cycle.
Bit 5-4 : Reserved
Bit 3 : select WDTO count mode.
= 0 second
= 1 minute
Bit 2 : Enable the rising edge of keyboard Reset(P20) to force Time-out event.
= 0 Disable
= 1 Enable
Bit 1-0 : Reserved

CRF6 (Default 0x00) - Watchdog Timer Time-out value
Writing a non-zero value to this register will load the watchdog counter and start counting down. If the Bit 7 and Bit 6 are set, any mouse Interrupt or keyboard interrupt event will reload the previously-loaded non-zero value. Reading this register will return the current value in the watchdog counter and not the watchdog timer time-out value.

Bit 7 - 0 = 0x00 Time-out Disable
= 0x01 Time-out occurs after 1 second/minute
= 0x02 Time-out occurs after 2 second/minutes
= 0x03 Time-out occurs after 3 second/minutes
= 0xFF Time-out occurs after 255 second/minutes

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CRF7 (Default 0x00)
Bit 7 : Mouse interrupt reset Enable or Disable
= 1 Watchdog Timer is reset upon a Mouse interrupt
= 0 Watchdog Timer is not affected by Mouse interrupt
Bit 6 : Keyboard interrupt reset Enable or Disable
= 1 Watchdog Timer is reset upon a Keyboard interrupt
= 0 Watchdog Timer is not affected by Keyboard interrupt
Bit 5 : Force Watchdog Timer Time-out, Write only
= 1 Force Watchdog Timer time-out event; this bit is self-clearing.
Bit 4 : Watchdog Timer Status, R/W
= 1 Watchdog Timer time-out occurred
= 0 Watchdog Timer counting
Bit 3 -0 : These bits select IRQ resource for Watchdog. Setting of 2 selects SMI.

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C. Appendix C: DIO

C.1 DIO Usage

For DOS system:
Execute the DIO.EXE file under DOS (DIO.EXE and CWSDPMI.EXE should be placed on same directory).

NOTE: The DIO function is from the WINBOND 83627UHG. Examples can be found on the Amplicon Manual/ Driver CD in the located in the 4bit-DIO folder.

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D. Appendix D: Power Requirements

D.1 External DC Adaptor

The system is supplied with a mains powered AC adaptor, with the following specification: -

- Power input: 100 ~ 240V AC, 1.2A, 50 ~ 60 Hz
- Output: +19V, 3.95A

D.2 DC Power Requirements

The system takes a direct DC voltage input with the following specification: -

- Input voltage rating 9~36V, 2.0A ~0.5A @ 17.5 watts

D.3 Power Ratings

The system has the following DC input ratings:-

- Typical Power Requirements 11.0~ 17.5 watts (excluding any plug-in card expansion).

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